In order to have a standard of comparison between pole and bush bean types, the first 5 internodes were measured and the means computed. For comparison between different varieties of pole beans the mean of the first 5 internodes was used. It was thought that the actual internode length found for some of the bush varieties might not be representative of the potential length which would have been attained by the upper internodes had not the production of a terminal inflorescence hindered further growth. To test this supposition crosses were made between a bush bean with long internodes and a pole bean with short internodes. The resulting hybrid showed an intermediate development in the F_1 and a wide range of variation in the F_2 generation. Bush beans with shorter internodes and pole beans with longer internodes than the parent types exhibited were obtained. Here again the variations were attributed to the action of multiple, non-dominant, independently segregating factors.

In conclusion, the author points out that the results of other investigators tend to show that quantitative characters in plants are inherited in two ways: (*a*) they are due to the action of a single Mendelian pair of factors showing complete dominance in the F_1 and a 3:1 ratio in the F_2 generation; (*b*) they exhibit an intermediate development in the F_1 and a wide range of variation in the F_2 generation. In class (*a*) belongs the determinate as opposed to the indeterminate habit of growth. Characters such as length and number of internodes fall into class (*b*). Such characters as those of class (*b*) have been interpreted in 2 ways. EMERSON, TSCHERMAK, EAST, and others attribute them to the interaction of many independently segregating factors, a theory in accord with the multiple factor hypothesis of NILSSON-EHLE. CASTLE, however, has interpreted such behavior as due, in some cases, to the modification of a unit factor through hybridization. In the case of the bean crosses, EMERSON implies that the factor involved would be that which determines habit of growth. After discussing this latter hypothesis and the assumptions its adoption would necessitate, he rejects it in favor of the multiple factor hypothesis.

Since, therefore, the characters involved in producing an effect seem to behave in different manners in inheritance, the author explains the variation in height following hybridization between pole and bush beans as due to the modification of the expression of a unit factor by the presence or absence of a number of factors producing other effects (as, for example, the effect of the determinate habit of growth on the potential length of internodes and on the number of internodes, etc.). However, the author disavows any intention of maintaining that this is the only possible explanation, and suggests that it may have to be modified to suit the results of further selection and hybridization experiments.—WILBUR BROTHERTON.

Philippine forests.—Our knowledge of the economic importance and the environmental conditions of some tropical forests has been advanced by a recent publication,[8] the joint product of a botanist and a forester. The former seems to have contributed many details concerning the floristic and ecological composition of the many variations in the dipterocarp forest. The quantitative data regarding the physical climatic factors are among the first to be collected in tropical forests according to modern methods. Soil moisture determinations for every month in the year, although unfortunately not accompanied by the wilting coefficient of the soil, show that the soil is quite uniformly moist throughout the year. Atmometer records throughout the year give for the first time the data for an adequate comparison with the evaporating power of the air in mesophytic forests elsewhere. In the dipterocarp forests of Mount Maquiling the maximum, minimum, and average daily rates of evaporation upon the floor of the forest are respectively 5.3, 0.7, and 2.5 cc., as compared with 10.6, 3.3, and 7.1 cc. obtained by the reviewer[9] in the mesophytic beech-maple forest of northern Indiana. The evaporation data are especially good because they are given not only for the floor of the forest but also for the second story trees, where there is protection by the general canopy of foliage, and give a maximum, minimum, and average daily rate of 7.5, 1.8, and 5.3 cc. respectively, and for the atmosphere above the tree tops, where the maximum, minimum, and average daily rates are 22.1, 8.4, and 15.7 cc. The leaves of the tree tops are thus exposed to an evaporating power of the air 6 times as great as that obtaining for the ground vegetation.

The forester's part of the report contains many data of the distribution, composition, volume, and rate of increment of these forests. The results show that they may, when cut and logged by modern methods, make a very important contribution to the lumber supply of the world. In this connection it is interesting to note that the average rates of growth of the dipterocarps are about the same as those of the hardwoods in the central deciduous forest region of the United States; while one of the most rapid growers, *Parashorea plicata*, appears to grow about twice as fast as *Liriodendron*. The relative advantages of various cutting systems are discussed, and the opinion expressed that planting of dipterocarps is not likely to be successful.

This article, together with the earlier reports of WHITFORD, gives a good general ecological knowledge of these interesting forests, and should furnish a good basis for the rapid evolution of methods of forestry which will render these natural resources a permanent source of wealth for these islands.—GEO. D. FULLER.

Distribution of species.—WILLIS in two recent papers[10] attempted to show that the geographical distribution of species within Ceylon is to be explained, not by natural selection, but by the relative local age of each species, basing his

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[8] BROWN, W. H., and MATHEWS, D. M., Philippine dipterocarp forests. Phil. Jour. Sci. Sect. A. **9**:413–561. *figs. 16.* 1914.

[9] BOT. GAZ. **58**:193–234. 1914.

[10] Rev. in BOT. GAZ. **61**:82. 1916; **62**:160. 1916.